SIEMENS

MAMMOMAT Novation DR

[redacted] CS

Update Instructions SP020/05/P

Title: Replacement of Compression Unit

Reason for Update:		☒ Performance	
Urgency:	☐ Immediate	☒ Within	6 months
Materials for classic update handling required?	☒ Yes	☐ No	
Remote update handling feasible?	☐ Yes, without CSE	☐ Yes, with CSE	☒ No
File download available?	☐ Yes	☒ No	
Materials free of charge?	☒ Yes	☐ No	
Return of parts?	☒ Yes	☐ No	
Estimated completion time:	6	Number of CSE's:	1
Customer application training?	☐ Yes	☒ No	

Systems/Products affected/System identifying IVK

Name	Material No.	Serial No.
MAMMOMAT Novation DR	066 46 900	1001 - 1114

Remark:

Components affected/to be modified

Name	Material No.	Serial No.	Component status affected
COMPRESSION UNIT	06658798	n.a.	n.a.

Remark:

Chg. Ref. No.: 870102
Name: M. Sobkowiak
Dept.: CS PS 24

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Document Revision Level

This document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

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Systems/Products Affected

MAMMOMAT Novation DR, part no. 066 46 900:

Systems from serial no. 1001 to 1114, except Systems with new Compression Unit, part no. 10050011

Reason for the Update

The reason for the update is an improvement of the electronic identification of the compression plates by the compression unit.

Prerequisites

The compression unit of the new design can only recognize compression plates of the new design. The old type of compression plates will not work. There is no cross-compatibility. Therefor it is absolutely necessary to perform the UI SP019/05/P first !
The UI SP019/05/P includes a 3 pages Site Questionnaire. The returned filled out form is the basis for the customer specific update kit with a set of new compession plates.

Special Tools

Standard tool kit

Dynamometer or scale with a digital display

Service PC

Documents

- Update Instruction SP020/05/P - SPB7-250.896.11.01.02 (this document).
- Software System Stand, Print No.: SPB7-250.816.03....
- QC manual

Ordering Information

The following update kit has to be ordered from CSML (SAP Distribution Channel, factory 2050) or BU Logistics (factory BU) (only with an order via BU Logistics):

Update Kit Compression Unit **Material no. : 101 40 373**

List the system Serial Number on the order!

Contents of the Update Kit

Update kit **101 40 373** contains the following parts:

Pos.	Quan.	Material No.	Name
1	1	SPB7-250.896.11.01.02	Update Instructions
2	1	100 50 011	Compression unit Novation
3	1	034 35 419	ETIKETT 26X52-PET

Tab. 1

The update kit will also include a customer specific set of compression plates.

The contents of this set is dependent of the number and types of (old) compression plates the customer owned. This set will contain the corresponding new types of compression plates.

Based on the above description, the CSE should be able to check the update kit for completeness prior to beginning the update.

Return of Parts

Please send back the old Compression Unit, **under the Update kit Material number (8429495)**, as soon as possible. You will get full credit after return !!

All parts must be correctly packaged! No credit will be issued for returned parts that have been damaged as a result of incorrect handling. These parts must be returned in accordance with ARTD Return Parts using the Returned Parts form.

Protective measures

System Power Supply

It is very important that any intervention in the equipment will start with disconnecting it from the power supply with the main circuit-breaker. Before removing or inserting any of the printed circuit boards, switch off the equipment.

⚠WARNING

If the MAMMOMAT Novation^{DR} system is only switched off at the control panel or with the circuit breaker CB S700, there is still voltage present within the generator. See the wiring diagram for MAMMOMAT Novation^{DR}.

Life-threatening electric shock hazard exists.

Disconnect mains cable and comply with the information on this page.

⚠WARNING

After shut-down of the system, there may still be 380 V DC present on the intermediate circuit of the MAMMOMAT generator.

Life-threatening electric shock hazard exists.

A bleader resistor is connected over the output DC capacitors.

The DC voltage will discharge below 60 Volt in 3 minutes.

The voltage level is indicated by LEDs H3 and H4.

PC Boards

⚠CAUTION

The p.c. boards contain electrostatic highly sensitive components.

If disregarded, the components could be damaged.

Use ESD equipment, ground prior to making contact and place the components on a conductive surface.

Presettings

n.a.

Work Steps

Disassembling the compression unit

- Turn the system OFF.
- Remove the covers from the swivel arm.
- Disconnect connectors X 872, X 873,X874 and X831 from board D805.
- Remove the bolts holding the compression unit.
- The compression unit can be dismounted carefully from the holder.

Compression unit assembly

- Install the compression unit in the reverse order of disassembly.
- Plug connectors X872,X873,X874 and X831 into board D805.
  a) The ribbon cable has to be led through the ferrit core (1/ Fig. 1) and

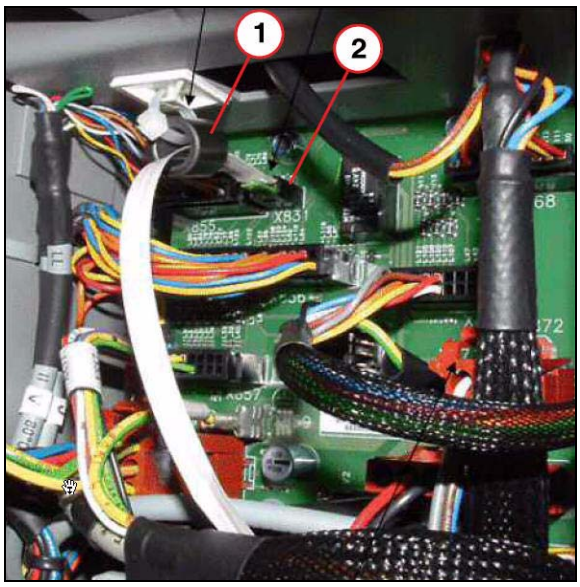

Fig. 1: D805

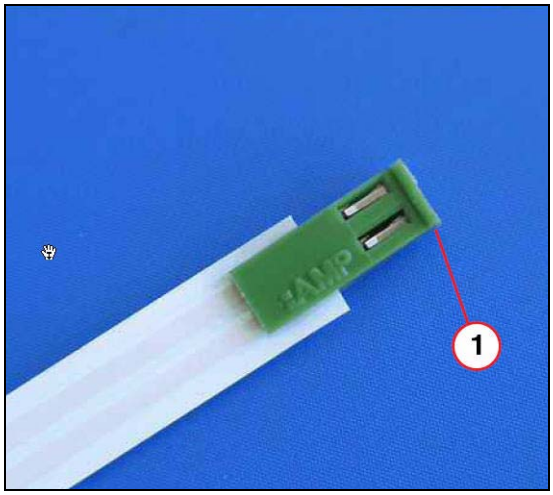

Fig. 2: X831

b) the connector on the ribbon cable has to be plugged in in such a manner, that the "nose" on the connector (1/ Fig. 2), and the pins are visible from above, they are on the upper side

The upper side of the connector, where the two pins are visible, as well as the "nose" protruding on the same side.

- Insert the three bolts and tighten them slightly (1/ Fig. 3).
- Secure the cables with cable ties.

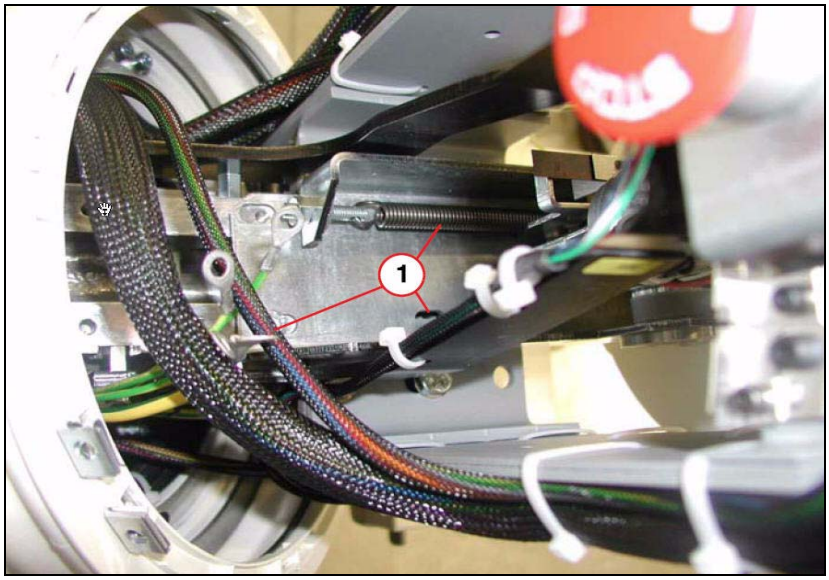

Fig. 3: Fixing bolts

NOTE	**Ensure that the compression unit is installed in the correct mechanical position. Use phantom images to check the unit's position after adjustment.**

NOTE	**When positioning the exchange compression unit, make sure that the two shrunk-on insulating hoses attached to the backside of the electromotor do not become entangled in the upper part of the arc (or dome, also called “church”). The electromotor has to move freely under that arc. Several manual checks are necessary (1/Fig. 12 / p. 32).**

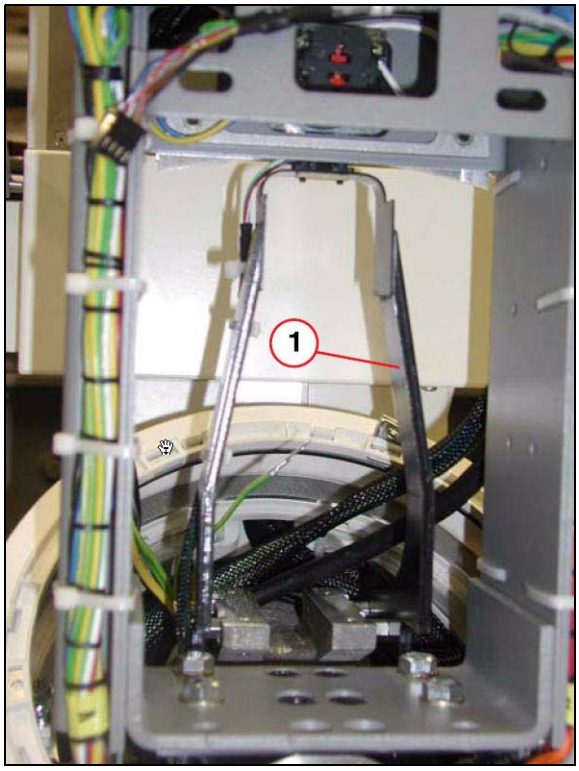

Fig. 4: Church

- Insert the compression plate into the compression unit. Manually move the compression plate downward toward the detector. It is important for the front edge of the compression plate to be parallel to the carbon-fiber plate edge.
- Manually move the compression plate upward. There must be 285 mm between the carbon-fiber plate edge and the metal sheet under the guide for the compression plate holder (Fig. 5).
- Securely tighten the three bolts for the compression unit holder (1/Fig. 3).

NOTE	**This document describes an initial calibration. Therefore, it describes cases in which a Mammomat system is equipped with a newly mounted compression unit, and therefore either the relevant data from another (e.g. the formerly mounted) compression unit stored in the system or no meaningful compression calibration stored in the system or no meaningful compression calibration data stored in the system.**

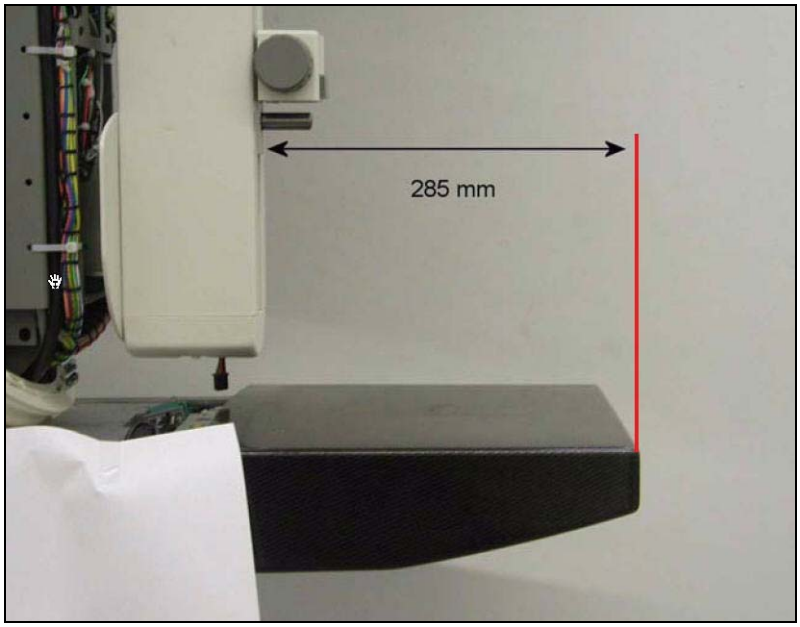

Fig. 5: Distance

Calibrating the compression unit

Connect the service PC according to Documentation Software System Stand, SPB7-250.816.03…

Start the service program.

In the main menu, under **Configuration -> Compression**, select **Optimized compression**. If you find the number/value 5137 in any of the (two) OPCOMP data fields shown in the appearing mask, change it to some other arbitrary number. If the value in those data fields differs from 5137, press F2 (save).

In the main menu, under **Configuration ->Compression**, select **Optimized compression dr** and repeat the procedure described above.

Prior to calibration, the following values must be entered in the system as default values.

Force = 0 kp	0066
Force = 20 kp	02D8
Preset force 3 kp	06
Preset force 20 kp	FF
Thickness bottom	0093
Thickness bottom	0
Thickness top	037E
Thickness top	180

- Move the swivel arm into the upright position, i.e., the vertical angle equals zero degrees (0°). This will be the position in which all following calibration steps will be performed.
- Select Calibration in the main menu, under Configuration > Compression.

Calibrating preset force 3 kp

- Position the cursor in the data field of the reset force 3 kp row with the help of the tabulator, i.e. “TAB key” on the keyboard. Turn the potentiometer F max. for preset force on the front top of the compression unit as far in the counter-clockwise direction as possible (until its mechanical stop).
- Press F3 (calibrate), then press F4 (update). The unit should now have stored the sampled value (in hexadecimals), corresponding to the minimum possible preset force of 3kp .

Calibrating preset force 20 kp

- Position the cursor in the data field of the preset force 20 kp row with the help of the “TAB key” on the keyboard. Turn the potentiometer F max. for the preset force on the front top of the compression unit as far in the clockwise direction as possible (until its other mechanical stop).
- Press F3 (calibrate), then press F4 (update). The unit should now have stored the sampled value (in hexadecimals), corresponding to the maximum possible preset force of 20 kp .

NOTE	**The potentiometer F max. for the preset force should remain at maximum throughout the entire calibration.**

Calibrating the thickness bottom”

When the thickness bottom is calibrated, no compression plate should be attached to the compression unit. Move the sled of the compression unit to its lowest position by means of the foot switch.

- Move the cursor to the data field for thickness bottom. The actual position of the two-digit cursor in the four-digit data field is of no importance.
- Press F3 (calibrate), then press F4 (update).

Calibrating the thickness bottom mm

- Move the cursor to the data field for thickness bottom mm.
- Use the PC keyboard to enter the value 0 (zero) in the data field.

Calibrating the thickness top

- Move the cursor to the data field for thickness top. The actual position of the two-digit cursor in the four-digit data field is of no importance.
- Move the sled of the compression unit to its highest position by means of the foot switch.
- Press F3 (calibrate), then press F4 (update).

Calibrating the thickness top mm

Attach a compression plate to the compression unit. Do not use the compression plate with the “flex” paddle for this work step. Use the compression plate with a regular paddle (recommended size: 18 x 24cm). This same compression plate has to be used for the final check of the compression after all the calibration steps have been performed. The object table (e.g. 18 x 24 cm) has to be mounted on the base plate.

- Position the cursor in the data field for thickness top mm.
- Move the vertical sled of the compression unit to its highest position by means of the foot switch. Use the hand wheel when the drive stops to ensure that the sled reaches its upper mechanical limit position.
- Measure the distance from the top of the carbon-fiber cover of the object table to the bottom of the paddle of the compression plate, e.g. by means of a tape measure. Enter the data measured in millimeters (mm) in the corresponding data field.

Calibrating force = 0 kp

NOTE	**The sled is still in its highest position. The regular compression plate 18 x 24 cm used for the previous calibration step is still attached to the compression unit. These are the correct prerequisites for the following calibration step. In order to eliminate the tolerances of the gear within the compression unit, it is important to move the sled down approximately 5 cm by means of the foot-switch. Do not use the hand wheel in this step! Proceed as follows:**

- Position the cursor in the data field of the force = 0 kp row with the help of the “TAB key” on the keyboard. The actual position of the two-digit cursor in the four-digit data field is of no importance.
- Activate the foot-switch to move the compression plate downward approximately 5 cm.
- Press F3 (calibrate), then press F4 (update).

Calibrating force = 20 kp

- Move the compression plate to its highest position.
- The compression plate used in previous step remains attached to the compression unit.
- Position the cursor in the data field of the force = 20 kp row with the help of the “TAB key” on the keyboard. The data field should contain the default hexadecimal value “02D8”. First perform a cross-check and then use the keyboards to make any necessary corrections.
- Place a suitable dynamometer, e.g. a very good quality scale with a digital display (having a measuring tolerance possibly lower than 100 pond/gram), onto the object table. Protect both the carbon-fiber cover of the object table and the plexi of the compression paddle with a cloth or towel against damage from the used scale.

- Move the drive downward from the compression plate via the foot switch. Never use the hand wheel during this measurement! The paddle will move and reach the scales. Hold the foot-switch steady. The paddle will compress the scales. Release the foot-switch only when the compression force, i.e. its value displayed on the scales, no longer changes. Wait approximately 10 to 15 seconds in order to allow the setup to stabilize before reading the measured value.
- Repeat the measurement once/twice if the scales show a value exceeding the prescribed tolerance +/- 0.3 kp of the nominal 20 kp. To do this, decompress by about 50 N via the other foot-switch and then compress again.
- If the (average) force shown on the scales doesn't fall into the given range, the hexadecimal value for force = 200 N stored in the data field has to be adjusted. (This is only an approximation, meant as an example; please observe the actual behavior: decreasing the default value "02D8" by four units (to: 02D4) will result in a force decrease of approximately 2 N. A corresponding increase (to: 02DC) will result in a force increase of approximately 2 N.)
- Adjust the hexadecimal value and save it by pressing F2.
- When the adjusted value is saved (under calibration), cross-check the force as described above. Adjust the hexadecimal value, if necessary. Perform another cross-check.
- Save the final value by pressing F2. This should exit the menu (otherwise press ESC).

Optimized compression

- Select Optimized Compression in the main menu, under Configuration > Compression.
- Re-enter the value "5137" in both OPCOMP data fields, i.e. for OPCOMP 18 x 24 and for OPCOMP 24 x 30.
- Save the entered value by pressing F2.
- Exit the menu by pressing ESC.

Checking the compression unit

Maximal compression – lowest position of the paddle

- Attach the same compression plate used for the work step: "calibrating the thickness top mm" to the compression unit.
- Activate the foot-switch to move the compression plate cautiously downward.
- Check whether the bottom of the paddle has reached the surface of the carbon cover.

Lower endpoint

- First detach and remove the compression plate from the unit.
- Attempt further downward motion via the foot-switch. Keep the switch pressed until the sled reaches its lowest limit position (mechanical stop).
- Read and record the compression thickness data (in mm) for the lower endpoint, as shown on the stand display.

Upper endpoint

- Move the compression plate upward to its upper endpoint.
- Reattach the compression plate and measure the distance from the top of the carbon fiber cover of the object table to the bottom of the paddle of the compression plate, e.g. by means of a tape measure. (As for the calibration of “thickness top mm”.)
- Read and record the corresponding data shown on the stand display. Compare it to the data just measured.
- Remove the compression paddle.
- Back up the stand values, according to Software Service, print number SPB7-250.816.03.02…

Final Work Steps

- Reinstall the swivel arm covers.
- Take exposures with 2-cm and 6-cm phantoms. Ensure that the edge of the compression plate (paddle) is not visible. Test compression plate recognition. Check whether the compression unit recognizes the compression plates. All compression plates in the compression unit are tested consecutively to determine whether the collimator is collimating to the correct size.
- The compression plate alignment and compression force tests have to be performed according to the QC manual.
- Update the system documentation.
  Update the revision level, the operating instructions and the technical documentation. Fill out, and if needed, make a copy of the attached "Completion Protocol/ Update Completion Form" and file it in the corresponding System Binder/User Handbook.
- The old compression plates should be removed from respective site. They may be disposed off according to Rules and Regulation on environmental protection of the country.
- Send back the old Compression Unit, **under the Update kit Material number (8429495),** (see chapter "Return of Parts").

Changes to Previous Version

n.a.

Completion Protocol

The update with the number **SP020/05/P** has been completed.

Material number: .....

Serial number: .....

Customer: ..... Functional Location: .....

Customer No.: .....

Name (CSE): ..... Telephone: .....

Country: ..... Location: .....

Date: ..... Signature: .....

Remark: .....

.....

NOTE

After completing the update, make a copy of this page, fill it out and file it in the corresponding System Binder/User Handbook.